規　格　書

PRODUCT　SPECIFICATION

產品類別 PRODUCT	■ POF		
日期 DATE	2013/2/06		
品名 PART NAME	Optical　Module		
料號 PART NO.	JST1221 (Transmitter)		
規格 TYPE			
文件編號 DOCUMENT NO.	JAPA031-006	版本 VERSION:	A1

備　　註　　(REMARK)

捷騰光電股份有限公司
文件管制中心
2013.2.07
發行章

solteam opto
捷騰光電股份有限公司
Solteam Opto, Inc.

桃園縣桃園市經國路888號7樓之4　7F-4,NO.888,Ging-Gwo RD. Taoyuan,Taiwan, 330
TEL:886-3-316-8682　FAX:886-3-316-8672
E-mail:jeateam@solteam.com.tw
Http://www.solteamopto.com.tw

◆ Features

- High speed signal transmission (16Mbps NRZ signal)
- Input TTL compatible
- Power Supply Voltage: +3 to +5V
- Low power consumption and current dissipation

◆ Description

The light transmitting unit is a standard-package product with connector and opto-electric component packaged with LED and drive IC. The function of unit is to change the electric signal into light signal and the light transmission is through plastic fiber.

The unit can be operated from 3V to 5V. The input signal is TTL compatible. The module has a maximum operating speed of 16 Mbps in NRZ signal. The light signal is coupled into a plastic fiber by a connector. The unit has high performance at low dissipation current, steady light output and efficient light coupling.

◆ Application

This Specification applies to the outlines of the fiber-optic transmitter unit for Digital audio Interface.

- DVD players
- CD players
- PC-Sound Card
- Digital TV
- Set top box

◆ Device Selection Guide

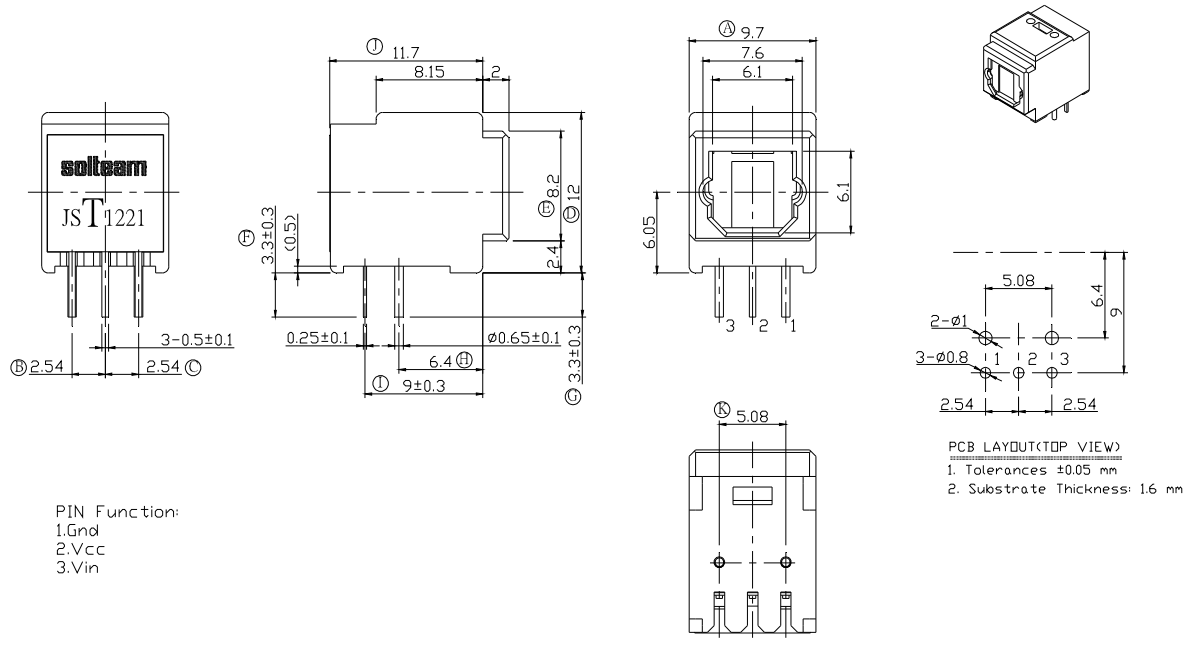
Chip		Operating Voltage (Vcc)	Dissipation Current (mA)	Fiber Coupling Light Output (dBm)		
IC Material	LED peak λ p(nm)		Typ.	Min.	Typ.	Max.
Silicon	650	2.7 - 5.5	5	-21	-	-15

◆ Absolute Maximum Rating (Ta=25℃)

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	-0.5 to 7	V
DC Input Voltage	Vin	Vcc+0.5	V
Power Dissipation	P	70	mW
Storage Temperature	Tstg	-30 to 80	℃
Operating Temperature	Topr	-25 to 70	℃
Storage Humidity	RH	<85	%
Soldering Temperature	Tsol	260*	℃
ESD Protection Voltage(HBM)	V_{ESD}	3K	V

*Soldering condition: solder at 260℃±5℃ for no more than 5 sec. Max. cycle: 2 cycles

◆ Outline Dimensions & PCB Layout



Notes:

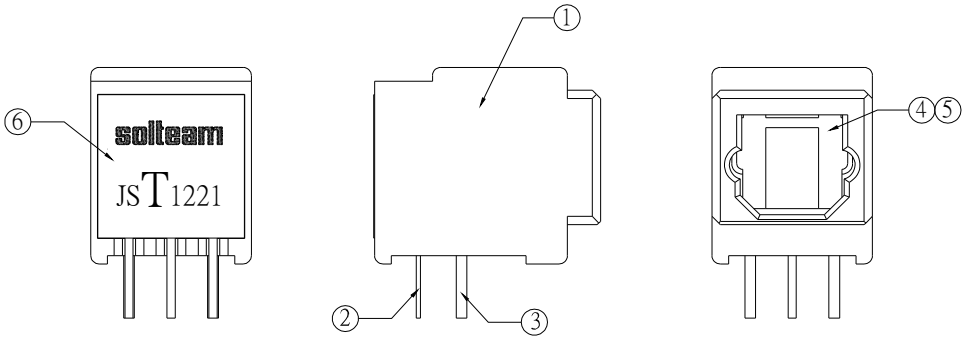
(1) All dimensions are in millimeters

(2) General Tolerance: ±0.2mm

(3) In compliance with ROHS/SONY SS-00259/JGPSSI

OP03-T15PBB Ver.A5
OP03-T23PBB Ver.A5
OP03-T45PBB Ver.A4

◆ List of Material



NO.	PART NAME	MATERIAL	FINISH	Q'TY
1	Housing	PBT(Color_Black)	———	1
2	Optical Component	Phosphor Bronze(PIN)	Sn Plating(PIN) (Min 100u")	1
3	Fix Pole	Phosphor Bronze	Sn Plating Min 120u"	2
4	Shutter	PBT(Color_Black)	———	1
5	Spring	SUS	———	1
6	Holder	PBT(Color_Black)	———	1

◆ Recommended Operating Conditions (Ta=25℃)

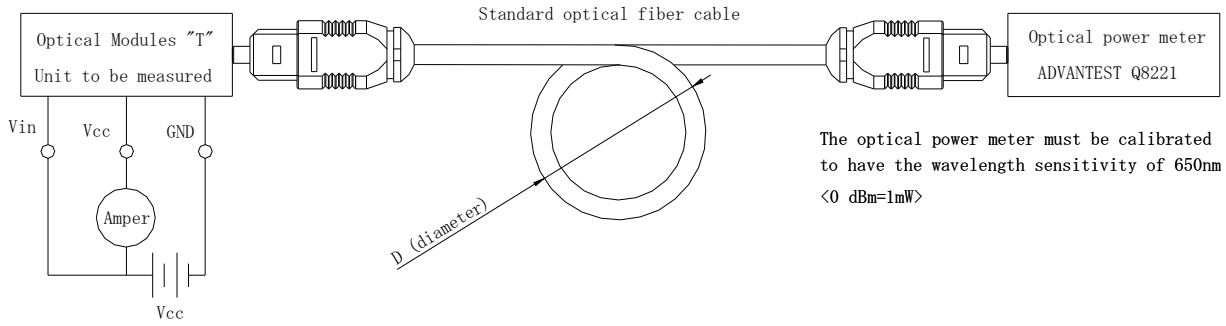
Characteristics	Symbol	Min	Typ.	Max	Unit
Supply Voltage	V_{CC}	2.7	-	5.5	V
High-Level Input Voltage	V_{IH}	2.0	-	V_{CC}	V
Low-Level Input Voltage	V_{IL}	0	-	0.8	V

◆ Electro-Optical Characteristics (Ta=25℃,Vcc=5.0V) (Note 1)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Peak Emission Wavelength	λp	-	630	-	690	nm
Transmission Speed	T	NRZ signal	-	-	16	Mbps
Transmission Distance	d	Using APF	0.2		20	m
Light Coupling Output (Note 3)	Pf	Measuring Method (1)	-21		-15	dBm
Dissipation Current	I_{CC}	Measuring Method (1)	-	5	10	mA
High Level Input Voltage	V_{IH}	Measuring Method (2)	2.0	-	-	V
Low Level Input Voltage	V_{IL}	Measuring Method (2)	-	-	0.8	V
Rise Time	tr	Measuring Method (3)	-	-	30	ns
Fall Time	tf	Measuring Method (3)	-	-	30	ns
Low to High propagation delay time	t_{PLH}	Measuring Method (3)	-	-	100	ns
High to Low propagation delay time	t_{PHL}	Measuring Method (3)	-	-	100	ns
Pulse Width Distortion	$\triangle t_w$	Measuring Method (3)	-15	<±5	15	ns
Jitter Time	△tj	Measuring Method (3)	-	1.5	15	ns

Note 1: The optical transmitter satisfies EIAJ CP-1201 digital audio interface standard.
Note 2: All Plastic Optical Fiber (980/1000um)
Note 3: Measure with a standard optical fiber, peak value.

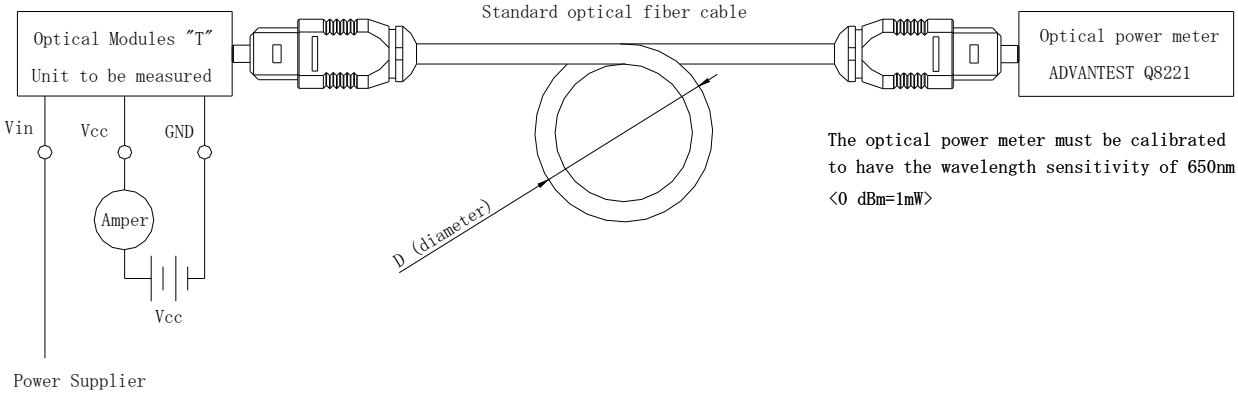
◆ Measuring Method (1)



Conditions:

1. Vcc = 5.0V ± 0.05 V (DC)
2. If bundle up the fiber optic cable, make it into a loop with the diameter D≧10cm.

◆ Measuring Method (2)



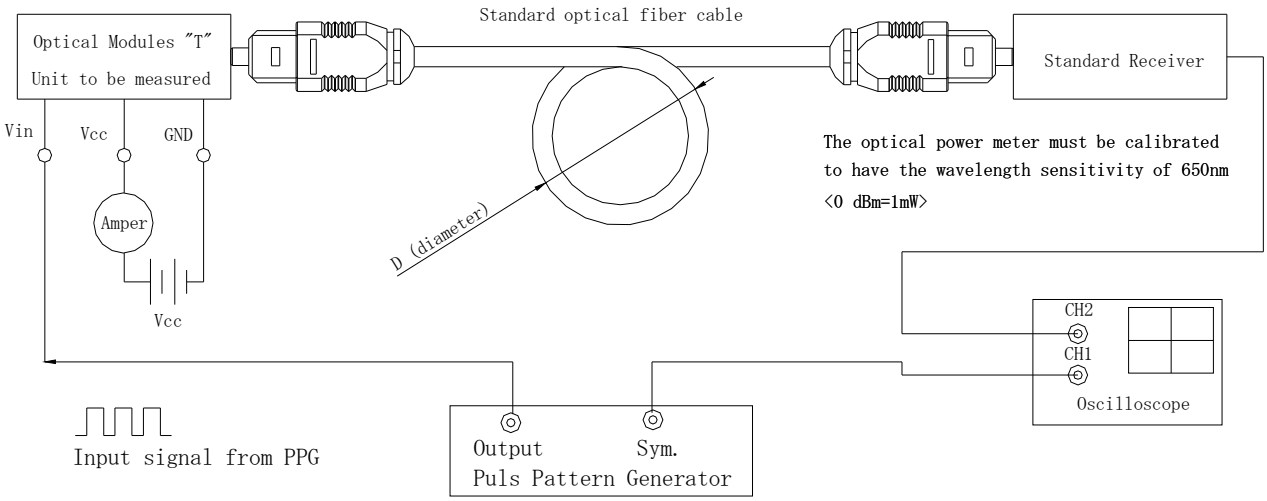
Conditions:

1. V_{CC}=5.0V(State of operating)
2. (Amper) Current Meter
3. V_{in}: to Power Supplier (or Signal Generator) (DC: 0 - 5V)

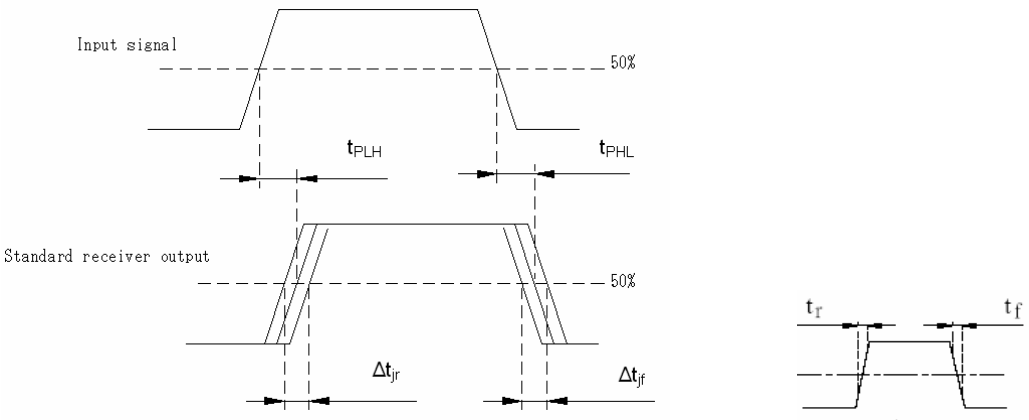
Input conditions and the method of judgment:

No.	Input conditions	Judgment
1	V_{in} ≧ 2.0V	-21≦Pf≦-15 dBm, Icc ≦ 10mA
2	V_{in} ≦ 0.8V	Pf≦-36 dBm, Icc ≦ 10mA

◆ Measuring Method (3)



Conditions:
1. Vcc= 5.0V
2. Vin= 16Mbps NRZ duty 50% signal. ($V_{IH} \geqq 2.0V$, $V_{IL} \leqq 0.8V$)
3. The probe for the oscilloscope must be more than 1MΩ and less than 10pF.
4. When jitter is testing, the Vin= 16Mbps PRBS signal ($V_{IH} \geqq 2.0V$, $V_{IL} \leqq 0.8V$)

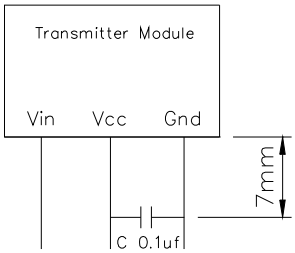


Test Items and Definitions

No.	Test Item	Symbol	Test conditions
1	L to H pulse delay time	t_{PLH}	It is defined by drawing in this page.
2	H to L pulse delay time	t_{PHL}	It is defined by drawing in this page.
3	Pulse width distortion	$\triangle t_w$	$\Delta t_w = t_{PHL} - t_{PLH}$
4	L to H Jitter	$\triangle t_{jr}$	Set the trigger on the rise of input signal to measure the jitter of the rise of output
5	H to L Jitter	$\triangle t_{jf}$	Set the trigger on the rise of input signal to measure the jitter of the fall of output
6	Rise Time	t_r	10%->90% Rise Time
7	Fall Time	t_f	10%->90% Fall Time

◆ Precautions for Using Method

1. Connect a by-pass capacitor (0.1uF) close to the module within 7 mm of the unit lead frame.



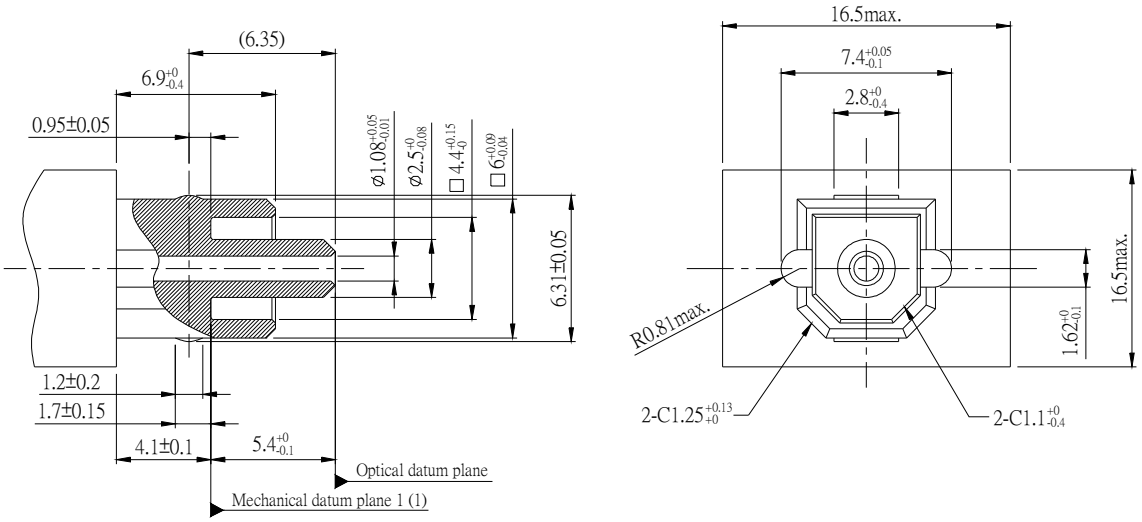
2. Take proper electrostatic-discharge (ESD) precautions while handling these devices. These devices are sensitive to ESD.
3. Maximum Rating: The maximum rating is the limit values which must not be exceeded when using the device. Any of the rating cannot be exceeding. If the maximum rating is exceeding, the characteristics maybe can not be recovered. In some extreme cases, the device may be permanently damaged.
4. Input Voltage: If a voltage exceeding the maximum rating value (Vcc+0.5V) is applied to the transmitter input, the internal IC may suffer damage. If there is a possibility that excessive voltage due to surges may be added to the input terminal, insert a protective circuit.

◆ Mechanical Characteristics (Ta=25℃)

PARAMETER.	CONDITION	MIN	TYP	MAX	UNIT
Insertion Force	In Compliance with EIAJ RC-5720 Initial value when a square connector is used	—	—	39.2	N
Withdrawal force		5.9	—	39.2	N

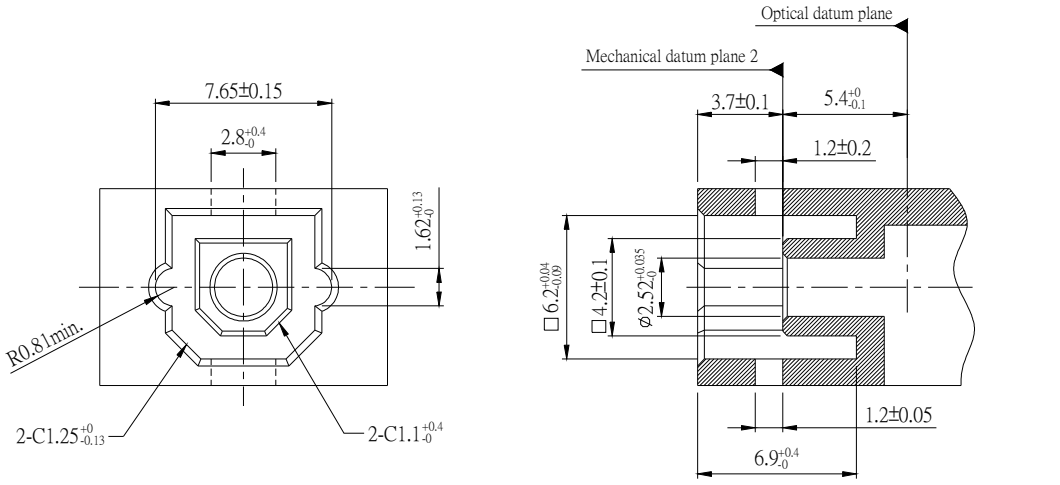
In accordance with EIAJ test plug

Unit: mm



(a) Plug

Unit: mm



(b) Receptacle

Note:
(1) Mechanical datum plane 1 is mated to mechanical datum plane 2.
(2) This dimension is applied when the optical fiber cord is 0FC2. 2-Y-PSI-980/1000 provided by JIS C 6820

◆ Reliability Test

No	Item	Test Condition	Samples(n) Defective(C)
1	High temp. storage	Ta=70℃±3℃, 240h	n=22, C=0
2	Low temp. storage	Ta=-25℃±3℃, 240h	n=22, C=0
3	High temp. operation	Ta=60℃, Vcc=5.0V ON ,240h	n=22, C=0
4	High temperature & Humidity. storage	Ta=40℃, 90%RH, 240h	n=22, C=0
5	Temp. cycling	Ta=-25℃(30min)~70℃(30min), 20cycles	n=22, C=0
6	Shock	Acceleration 1000m/s^2,pulse width 6 ms,X,Y,Z/3times each direction.	n=11, C=0
7	Vibration	10~55Hz/sweep 1 min, amplitude: 1.5mm, X,Y,Z/2 hour each.	n=11, C=0
8	Terminal strength(Tension)	Weight: 5N, 30s/each terminal.	n=11, C=0
9	Terminal strength(Bending)	Weight: 2.5N(In the axial direction),0°→90°→0°, 2 time/each terminal.	n=11, C=0
10	Soldering Heat	Ta=260℃±5℃, 5sec, 2 times. Dip the area at a distance of more than 1.6mm from the element base, Ta=350℃±5℃, 3sec, 1 time. Dip the area at a distance of more than 7mm from the lens.	n=11, C=0
11	Solder ability	Ta=245℃±5℃ 5Sec. Used as rosin flux.	n=11, C=0
12	Mechanical Operation	Do mating and un-mating for 500 cycles at the speed of 5~10 cycles per minute and the following value shall be satisfied.	n=11, C=0
13	Repeated Operation	Do mating and un-mating for 1000 cycles at the speed of 5~10 cycles per minute. After 1000 times the function shall be no trouble. Shutter shall be no damage.	n=11, C=0

In the test item 1 to 5 and 10 mentioned above, the unit shall be remained in standard atmospheric conditions for 2 hours and after which measurement shall be made. Standard atmospheric conditions refer to ambient temperature at 5℃~35℃ and relative humidity at 45%~85%.

◆ Judgment Criteria

In the testing items of 1 to 7 and 10 electro-optical characteristics shall be satisfied in following:

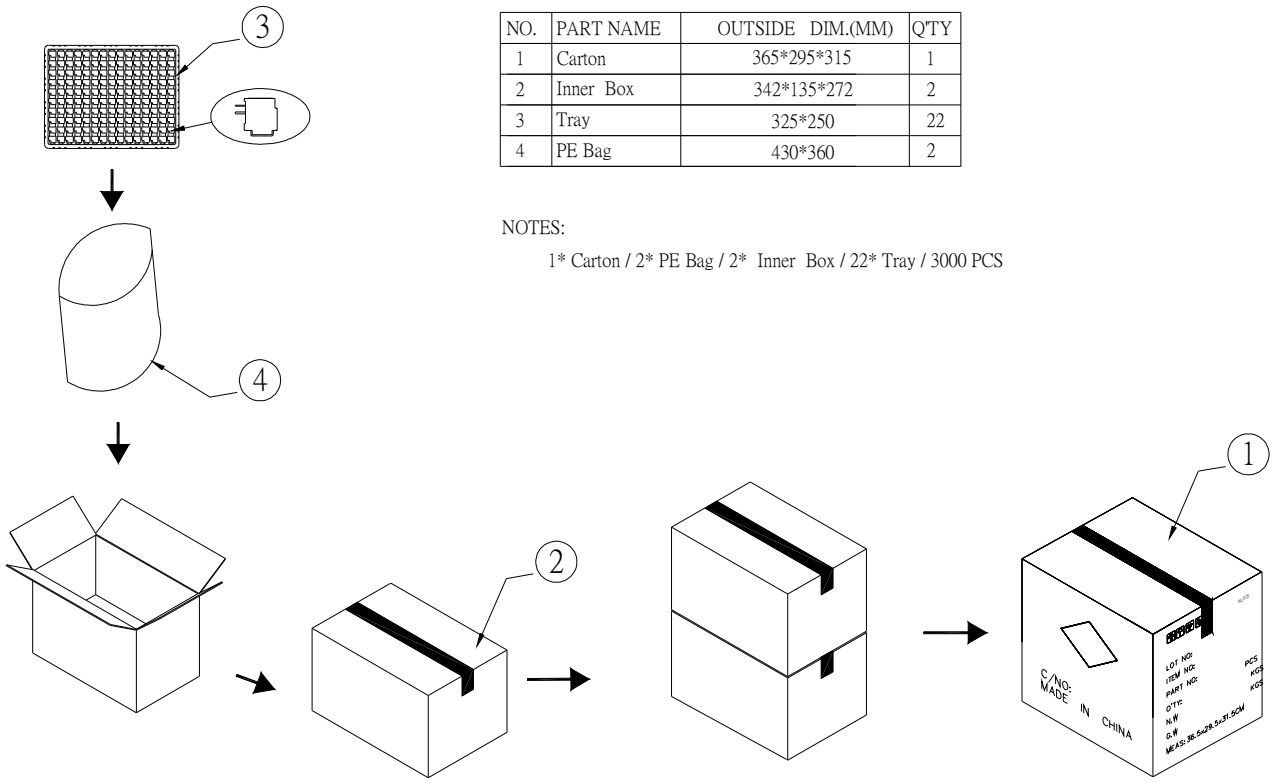
Upper specification limit×0.8 or less Lower specification limit×1.2 or more	Upper specification limit ×1.2 or less Lower specification limit ×0.8 or more	Upper specification limit×1.2 or less Lower specification limit×1.2 or more
Current consumption (I_{CC}) High Level Input Voltage (V_{IH}) Low Level Input Voltage (V_{IL}) Low to High propagation delay time (t_{PLH}) High to Low propagation delay time (t_{PHL}) Jitter Time (Δ_{tj})	Fiber Coupling Light Output (P_f)	Pulse Width Distortion (Δ_{tw})

Test No.8 & 9： Without cracks on the terminal.

Test No.11： A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed.

Test No.12： Insertion Force≦**39.2N ; 3.9N**≦Withdrawal force≦**39.2N.**

◆ Package



NO.	PART NAME	OUTSIDE DIM.(MM)	Q'TY
1	Carton	365*295*315	1
2	Inner Box	342*135*272	2
3	Tray	325*250	22
4	PE Bag	430*360	2

NOTES:

1* Carton / 2* PE Bag / 2* Inner Box / 22* Tray / 3000 PCS

Revision History

No	Date	Description	Page	Revision
1	2012.12.13			A0
2	2013.01.30	Revision material quality chart	P4	A1